

HIGH-STRENGTH LIGHTWEIGHT COMPOSITE FABRIC WITH LOW GAS PERMEABILITY

Abstract of the Disclosure

A laminate is disclosed for high strength, low weight gas enclosure applications such as aerostats or airships. The laminate is formed of at least one woven fabric layer with an aggregate strength greater than 10 grams per denier. The yarns in the fabric have sufficient twist to provide the desired tensile conversion but less than the amount of twist that would produce unsatisfactory flex fatigue. The fabric has a yarn to fabric strength ratio sufficient to impart tear resistance to the fabric, but less than the coarseness ratio at which flex fatigue performance is unsatisfactory, and the fabric has the minimal number of crossing points among the woven yarns that will impart sufficient integrity for the fabric to be manufactured into the laminate. A gas barrier material is then laminated to the fabric layer.

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